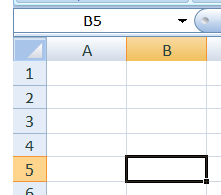
**Statistics and Data Analysis: Ch. 2 Using Excel for Categorical Displays**



1. Get your laptop out of the cart in the front of the room and log on.
2. Open the Microsoft Excel 2010. Excel will open with a blank spreadsheet.

The sheet is broken into individual cells.

Rows are numbered Numerically and the Columns are denoted by Alphabetical labels. Each cell has a label giving it's column and row position.

*Example:* cell B5 is in the second column(B) and fifth row (5).

**Entering Data**

1. To enter data simply click on the desired cell and type.

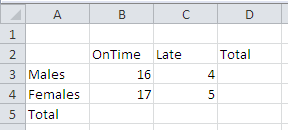
Hitting **Tab** will move the highlighted cell one place to right.

Hitting **Enter** will move the highlighted cell one down.

Type the following information in the cell given:

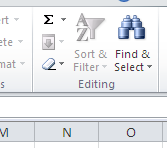
|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Cell*** | A3 | A4 | A5 | B2 | C2 | D2 | B3 | C3 | B4 | C4 |
| ***Data*** | Males | Females | Total | OnTime | Late | Total | 16 | 4 | 17 | 5 |

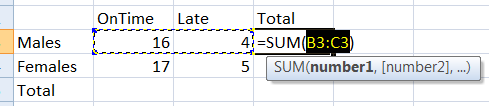
Your table should look like this:



**Using formulas**

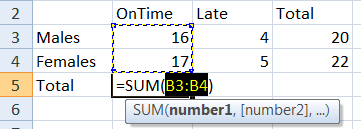
1. Excel will perform many simple and complex calculations. A very useful formula is the AutoSum.

* Select cell D3. We wish to total the males.
* Look at the Editing Tab on the top right of the screen
* Find the feature called AutoSum,  and click on the button.
* The following screen should appear:

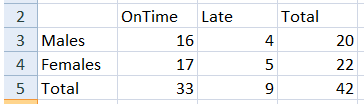


* You should see that the two cells to the left have been highlighted with a dashed box. In Cell D3 the formula has been written "=SUM(B3:C3)"
  + The “=” sign tells Excel that a formula is to be calculated
  + The “SUM(“ is an abbreviation for an already existing formula that has been loaded into Excel.
  + B3:C3 gives the range of cell that are to be used
* Hit Enter and cell D3 should read 20.

1. Select cell D3 again. Directly above the Column labels there is the formula bar. There you should see the following:  Even though the cell has the value of 20, the formula used to calculate it is saved for future editing.



1. Select cell D4 and use the AutoSum to find the total number of Females.
2. Select cell B5 and click on the AutoSum. You can see that Excel recognized the data was above.
3. Find the rest of the totals using the AutoSum feature. Your chart should now look like this:



1. Close the Excel file (not the Excel program) without saving. (Click on the lower X in the top right corner of the screen)

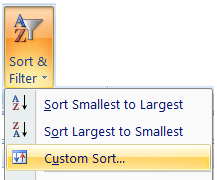
**Using Already Compiled Excel Files**

1. Click on the File Menu tab at the top of the page.  Select the option “Open”
2. Go to My Computer -> Sth\_Shares…(O:) -> McNelis -> SDA
3. Select the File called "Mock Data"
4. If you see the YELLOW bar across the top that looks like this: 

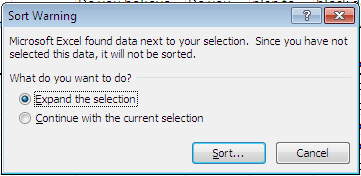
please click ENABLE EDITING.

1. Open a Word Document. At the top, please put your name, and the title “EXCEL INTRO.” Then answer the following below that:
   1. **How many respondents are there?**
   2. **What are the variables? List them, and next to each determine if they are Categorical (C) or Quantitative (Q) by putting the letter in parentheses (like I did here)**
   3. **How many respondents prefer diet soda?**
   4. **How many respondents prefer regular soda?**
   5. **How many respondents were males and Unami?**

***Save the file as: yourLastName-Excel Intro. Do not close it.***

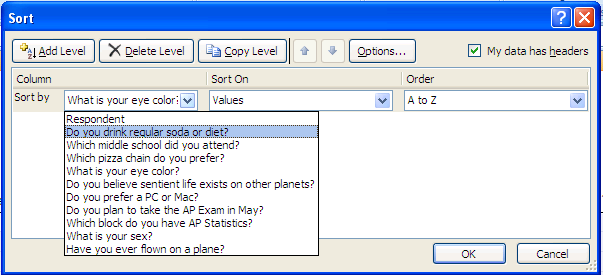


1. One way to simplify getting information is have the table reordered. Select cell A1 and holding the left mouse key down, highlight all the data. (A1 to K49)
2. In the Editing Tab at the top right click on the Sort & Filter drop down menu and select Custom Sort.
3. If you see the following window:



Select “Expand the selection” and then “SORT.”

1. A new pop-up Sort menu will appear. In the “SORT BY” drop down menu, select "Do you drink regular soda or diet?" Click on OK.



1. The table will be sorted by choice of soda with “Diet” first, “None” second, and “Regular” last.
2. To count the number that preferred Diet, highlight all the cells that say Diet. On the bottom right of the screen should be a text that states "Count = 5"
3. Let’s do another sort.

* Highlight the respondents again.
* Select Custom Sort again.
* If you get the warning box again, click “Expand Selection.”
* Change the Sort by to "What is your sex?" Then click on the Add Level button. 
* This creates another level to sort the data by.
* In the drop down menu select "Which middle school did you attend?" and click OK.

1. Look in row J. The table will now be sorted first by Females and Males. Then within each group they will be separated by the different middle schools (row C).
2. Answer the following questions in the Word document you created earlier. Use the Custom Sort feature to help you with these.

**6) (a) How many respondents were female?**

**(b) How many females attended Unami? (use the data you have now)**

**7) How many people preferred Pizza Hut? (sort by Pizza chain)**

**8) How many people that preferred Papa Johns also preferred Macs? (sort by pizza chain and then by**

**computer preference)**

**9) How many people that believed in aliens also preferred Macs? (use your sorting feature!)**

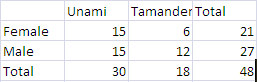
***Save your file again!***

**Creating Two-Way Tables**

1. Enter the following data in the given cells

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Cell | N4 | N5 | N6 | O3 | P3 | Q3 |
| Text | Female | Male | Total | Unami | Tamanend | Total |

1. Fill in the table you created with the numbers (Enter the number of Females that attended Unami in cell O4, the number of Females that attended Tamanend in cell P4, the number of Males that attended Unami in cell O5, and the number of Males that attended Tamanend in cell P5). Find the information by using the Custom Sort feature on the data table (go back to #12 on this worksheet if you need help).
2. Use the AutoSum to find the totals. Your chart should look like this:



**Creating a Percentage table.**

1. Highlight cells N3 to Q6 (the entire table that you just made). Hold **Ctrl** and hit **C** to copy the table.
2. Click on cell N8. Hold **Ctrl** and hit **V** to paste the table.
3. Click on the Unami females cell (cell O9).

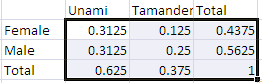
* We want to change this number to a percent. So we need to divide it by the total.
* Type in “=O4/48” 
* This will take the number in cell O4 and divide it by the total number of students (48).
* This will be the percent of all students that were females and attended Unami. 

1. Let’s do this to the other cells in the table. We could repeat the steps above. But there is an easier way to do this.

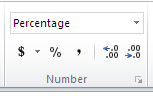
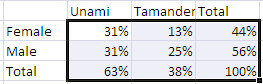
* Click back on cell O9.
* At the bottom right of the cell is a small black square.
* Put the curser over the square and the curser should change to a black **+**.
* Hold the left mouse key down and drag the **+** to the right two cells.
* This will copy the formula to those cells, thus changing them into percentages too.



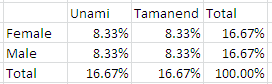
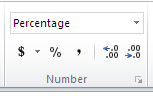
1. Click and hold onto the black square again (it should be at the bottom right corner of the Female Total cell) and drag the box down two cells so it converts the Males and the bottom total row into percentages too.



1. Now change the decimals to percentage: Make sure the table is highlighted (like above) and in the Number Menu at the top of the page select the “%” option.



1. When we converted to %, it rounded our answers. We want to have our answers with 2 decimal places.

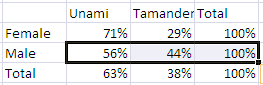
* To add a decimal place to the values, click the  button in the Number Menu at the top of the page.
* This will add one decimal place. Click it again to add another.

1. To find the percent of Female and Male students that came from the different middle schools:

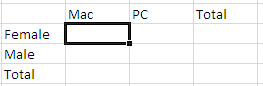
* Click on cell O9.
* Type in “=O4/21”
* This divides the females from Unami by all females (21).
* Using the black square in the lower right corner copy the formula to the cells to the right.  **Don’t copy the formula down though!**

1. Now compute the percentages for the male students:

* Click on cell O10 and type “=O5/27” 
* This divides the males from Unami by all males (27).
* Using the black square copy the formula to the cell to the right.



1. From the table it can be seen that Females were much more likely to come from Unami than Males since 71% of Females were from Unami but only 56% of Males were from Unami.

****

1. Complete the following and save answers into your Word document.

**10) In cells S3 to V6 enter the following two-way table (at right):**

**11) Using the Custom Sort feature, find the correct counts from the data. Then, highlight the entire table, copy the table (Ctrl & C), and paste the table (Ctrl & V) into your Word document.**

**12) Now go back into your Excel document. Copy the table into cells S8 to V11. Create a Percentage table. Make sure your percentages have 1 decimal place on them. Copy this new percentage table into your Word document.**

**13) Go back to your Excel document. Using the table in cells S8 to V11, find the percent of Females and Males that prefer the different kinds of computers (like we did in steps 8 & 9 in the worksheet above). Copy the table into your Word document.**

**14) Do Females prefer Macs more than Males? How can you tell? Use the percentages in your table to justify.**

***Save your document!!***

**Creating Bar Charts**

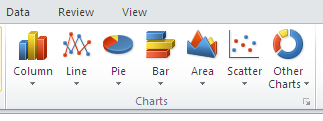
1. In order to create bar charts, you must first calculate the totals of each value of the variable you are analyzing. Let’s use the variable Eye Color. Type the following into Excel in the specified cells:

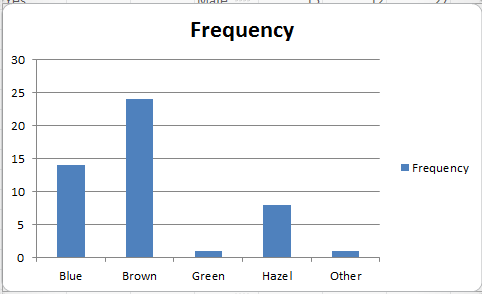
|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cell | N13 | O13 | N14 | N15 | N16 | N17 | N18 |
| Text | Eye Color | Frequency | Blue | Brown | Green | Hazel | Other |

1. Using the sort feature find the total number of students in each eye color and enter those in the O column (O14 to O18).



1. To create a basic bar chart:

* Highlight cells N13 to O18.
* On the top left of the screen click on the **Insert** tab.
* In the **Charts** section at the top of the screen, click on the **Column** drop down menu and select the first graph (at the top left, the first one in the 2D column section).
* A Bar chart should appear in the middle of the screen.

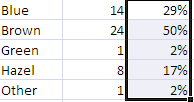


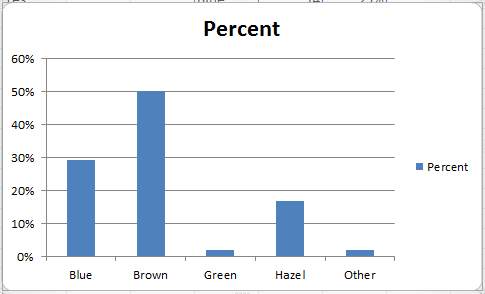
* Change the word “Frequency” at the top of the chart to “Eye Color.” Double click on it and type in Eye Color.

1. The chart style can be changed easily by selecting different charts from the Charts Layout menu.

Try out some different looks.

1. To delete the graph, select it and then hit the **Delete** key. Delete the bar chart you just made.
2. To create a bar chart of the percentages you must first calculate the percentages.

* Click on cell P14 and type in “=O14/48”.
* You will then see: 
* Use the black square (in the bottom right corner of the cell) to copy that formula down the column to cells O14 to O17.
* Then convert the decimals to percentages as before.

1. To create the graph, highlight cells N13 to N18. Hold the **Ctrl** key and highlight cells P13 to P18. Both groups should be highlighted. Insert the bar chart as before. (Make sure you choose the Column Charts).
2. Change the title of the graph by double clicking the title. Change it to “Percent of Eye Color” Also get rid of the legend on the side by clicking on it and hitting Delete.
3. To copy a graph into Word:

* Same way as before: Select the graph, hold **Ctrl** & hit **C**, then in Word hold **Ctrl** & hit **V.**

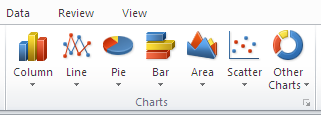
1. Delete the bar chart from Excel
2. Complete the following and copy all work to your Word Document:

**15) Starting in cell N20 create a table of the distribution of Soda Choice (Regular, Diet, None). Highlight the cells N20 to O23, copy the table, and paste it in the Word document.**

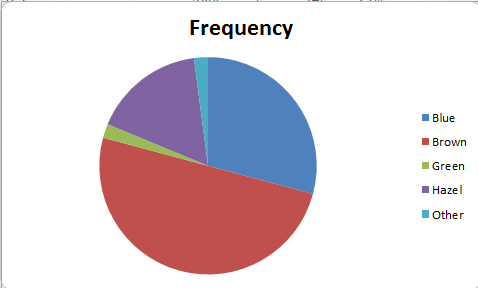
**16) Create a bar chart for Soda Choice. Copy the graph and paste it your Word document.**

**17) Calculate the percentages of Soda Choice in cells P20 to P23 and create the bar chart of the percentages. Copy the graph and paste in the Word document.**

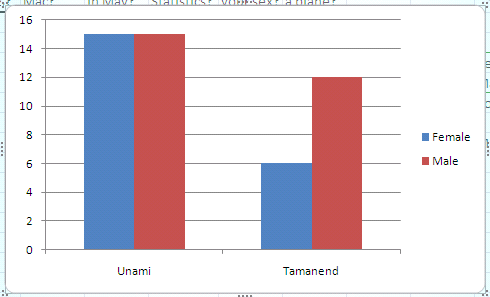
**\*\* Once finished, you can delete these charts from excel\*\***

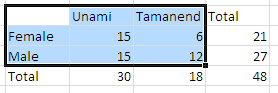
***Save your document!***

**Creating Pie Charts**

1. Highlight cells N13 to O18.
2. To create Pie Chart select **Insert** menu. In the **Charts** tab click on the **Pie** drop down menu and select the first one (top left corner).
3. The following chart should appear.
4. Change the title of the Pie chart to say “Eye Color.”
5. The chart style can be changed easily by selecting different set charts from the Charts Layout menu. Try out some different looks.
6. Delete the Pie Chart.
7. Complete the following and copy all work to your Word Document:

**18) Create a Pie Chart for Soda Choice using the data you put into cells N20 to O22.**

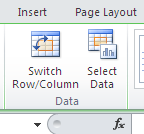
***Save your document!***



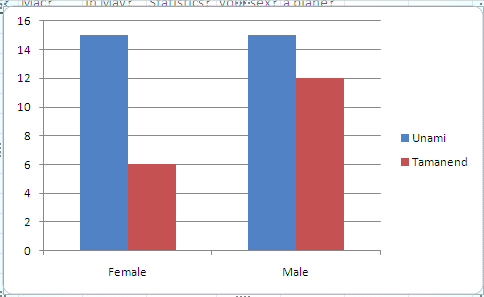
**Creating Comparative Bar Charts**

1. Highlight cells N3 to P5.
2. To create comparative bar charts:

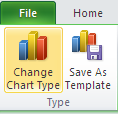
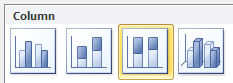
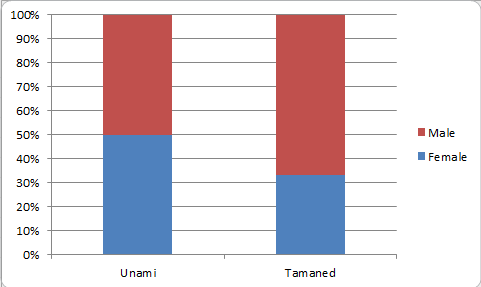
* Select the **Insert** menu.
* In the **Charts** tab click on the **Column** drop down menu and select the first graph again.
* This will create a Bar Chart that will have two bars for Unami and two bars for Tamanend.
* The blue bar represents the number of females and the red bar the number of males in each school.



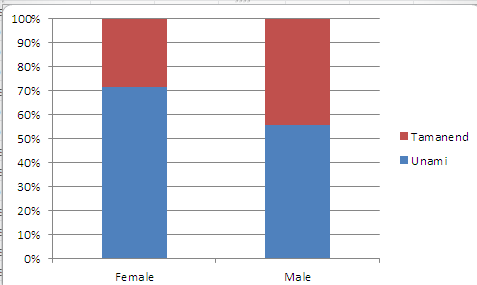
1. To switch the variables:

* On the top left in the **Data** tab click on **Switch Row/Column** button.
* This will change it so that there are two bars for the Females (Unami and Tamanend) and two for Males (Unami and Tamanend).

1. To create a stacked bar chart (also called a comparative bar chart):

* This will compare the percent of Males and Females that are in Unami only, and then do the same for Tamanend.
* Make sure the bar chart you just made is selected.
* Switch the Row/Column again so that Middle School is on the bottom axis.
* Click on **Change Chart Type** in the top right corner of the page.
* Select the third choice for Column, 100% Stacked Column.
* You should see the graph below.
* From this we can see that in Unami, there are an equal amount of males and females. However in Tamanend, there are more males than females.

1. Let’s look at the variables the other way. Let’s look at just the females, and then break it up into Tamanend and Unami. Then let’s do the same for the males.

* Click the “Switch Row/Column” button again (up in the top left corner of the screen)
* You should see this graph:
* Looking at this, we can see that ***of the females,*** more came from Unami. Whereas ***of the males,*** it was about equal in which middle school they came from. So Females are more likely to come from Unami than Males.

1. Complete the following and copy all work to your Word Document:

**19) Create a comparative bar chart for the two-way table of Sex vs Computer Preference you created in cells S3 to U5. Copy the graph to your Word document.**

**20) Switch the rows and columns on the chart. Copy the graph to your Word document.**

**21) Create a 100% stacked bar chart for the two-way table with Computer Preference being separate bars (computer preference on the bottom axis). Copy the graph to your Word document.**

**22) Are Males and Females just as likely to prefer PCs? How can you tell? Justify.**

**ALL DONE!**

* **Save and close your Word document.**
* **Close the Excel File without saving.**
* **In the Desktop open My Computer ->** **Sth\_Shares…(O:) -> McNelis**
* **Open My Documents and find your Word document. Drag your file into the STU\_DROP\_FOLDER**